

ABSTRACT OF THE DISCLOSURE

A lithium-manganese complex oxide represented by a formula  $\text{Li}[\text{Mn}_{2-X-Y}\text{Li}_X\text{M}_Y]\text{O}_{4+\delta}$  (wherein M is at least one element selected from the groups IIa, IIIb and VIII of the 3rd and 4th periods, and  $0.02 \leq X \leq 0.10$ ,  $0.05 \leq Y \leq 0.30$  and  $-0.2 \leq \delta \leq 0.2$ ), having a spinel crystalline structure of  $0.22^\circ$  or less of half value width of the (400) plane of powder X-ray diffraction by  $\text{CuK}\alpha$  and an average diameter of crystal grains by SEM observation of  $2 \mu\text{m}$  or less, and a spinel crystalline structure lithium-manganese complex oxide having a BET specific surface area of  $1.0 \text{ m}^2 \cdot \text{g}^{-1}$  or less; production methods thereof; and a lithium secondary battery which uses the lithium-manganese complex oxide as the positive electrode active material are described.